

Improvement of digestive symptoms in fibromyalgia patients following a diet modification according to histamine release test – an observational study

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Abstract

Introduction: There is growing interest in the relationship between fibromyalgia and processes related to food, such as food intolerances. In fact, different associations have been described between the control of dietary habits and the improvement of the different symptoms of fibromyalgia.

Material and methods: We collected the results of applying a specific test of histamine release related to the diet of patients with fibromyalgia, and evaluated the changes in terms of the symptoms usually described by the patients. A total of 84 patients who met the established criteria were recruited; 40 of them underwent the exclusion diet for a period of 6 months, while the remaining ones continued with their usual dietary habits. All patients were instructed not to modify any other parameter during the study, such as medication, exercise, or other complementary treatments. The parameters studied were as follows: the Fibromyalgia Impact Questionnaire (FIQ), the Gastrointestinal Symptoms Rating Scale (GSRS), the pain Visual Analogue Scale (VAS), as well as the patients' body weight was controlled.

Results: There was a significant improvement ($p < 0.05$) in the group of patients who underwent the exclusion diet in assesment by GSRS and in total in total body weight. There were no differences compared to the rest of the patients in terms of VAS and FIQ.

Conclusions: Diet modification in patients with fibromyalgia by specific histamine release test improves certain clinical parameters related to the symptoms of the digestive sphere, compared to the control group. Our work opens a possible way of non-pharmacological treatment to improve some symptoms of this very prevalent disease.

Key words: fibromyalgia, exclusion diet, histamine, food intolerance, gastrointestinal symptoms.

Introduction

Fibromyalgia (FM) is a disease of unknown origin, affecting approximately 5% of the population, mostly young women [1]. According to some studies, 90% of people with FM use complementary medicine to control their symptoms [1].

The results show a higher acceptability of non-pharmacological treatments compared to pharmacological treatments, although the assessment of efficacy is similar [2]. Many patients find that food exacerbates their symptoms [3], so elimination diets can be both a diagnostic tool and a therapeutic intervention for people with a suspected food sensitivity or allergy [4]. They are clinically rele-

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Submitted: 06.03.2022; Accepted: 03.06.2022

vant not only for patients with functional gastrointestinal disorders, but also for those with conditions where symptoms are refractory and diagnosis is elusive. Elimination diets may help the clinician to make a diagnosis or to identify an underlying cause of symptoms. Although no particular diet has been found to have a significant impact in FM, they may be useful in improving gastrointestinal distress in certain FM patient populations [5].

So far, there is insufficient evidence to recommend a specific nutritional intervention for the treatment of FM [6], and no specific foods that may exacerbate or cause symptoms have been investigated [4].

The main purpose of this prospective study was to determine whether after applying a specific histamine intolerance test, and applying a diet of exclusion of those foods with high indices in the test, the symptoms typical of the disease improve.

Table I. Food groups eliminated from the diet according to histamine levels, in total number and percentage

Food groups	Number (n)	Percentage [%]
Milk derivates	29	72.5
Gluten derivates	25	62.5
Tomato	14	35.0
Garlic	9	22.5
Oily fish	9	22.5
White fish	8	20.0
Meat products	7	17.5
Pork products	7	17.5
Chicken products	6	15.0
Rice	6	15.0
Egg	6	15.0

Material and methods

A total of 84 patients with FM according to the 1990 ACR classification criteria [7] and the new 2010 diagnostic criteria [8] were recruited during the years 2019–2020, all of whom were women between 18 and 65 years of age. Patients with any other disease that could interfere with the results, e.g. coeliac disease, or patients following a vegetarian diet or already following an exclusion diet, were excluded from the analysis.

Forty participants underwent a food intolerance test by measuring direct basophil degranulation incubating overnight patients' blood with different food allergen extracts – the 11 most commonly consumed food groups in the Mediterranean diet (Table I).

Histamine was measured as a marker of basophil degranulation by means of a commercial histamine assay kit. This test uses natural allergens. To analyse the results, a standard curve with known amounts of histamine is performed. The total blood histamine content and its basal release in the absence of food antigens must also be known. The results are expressed in terms of histamine release values when the patient's blood is confronted with the battery of foods studied.

According to the results obtained, the foods that gave the highest histamine indices were completely excluded from the diet, under the supervision of a nutritionist. The remaining 44 patients were allowed to continue with their usual diet, explaining to all patients that they should not modify other parameters, such as medication, exercise or alternative therapies, during the 6 months of the study.

Prior to participating in the study there were no significant differences between the groups in terms of pharmacological and non-pharmacological therapies.

Table II. Results of the means and confidence intervals (CI) of the biodemographic data, and different scales at the beginning (1) and end (2) of the study, with their statistical significance (p), both in the group that followed the exclusion diet and in the control group

Parameters	Diet group (n = 32)			Control group (n = 35)		
	Mean	CI	p-value	Mean	CI	p-value
Age	48	3.2		47	3.6	
Weight1	74	25.5	0.01	70	23.1	0.50
Weight2	68	17		73	24	
VAS1	7.8	2.2	0.10	8.1	2.4	0.26
VAS2	7.2	2.0		7.9	2.1	
FIQ1	78	16	0.10	80	21	0.10
FIQ2	73	19		76	19	
GSR1	2.3	1.1	0.05	2.2	0.9	0.50
GSR2	1.2	0.7		2.4	1.1	

FIQ – Fibromyalgia Impact Questionnaire, GSR – Gastrointestinal Symptoms Rating Scale, VAS – Visual Analogue Scale.

The assessment scales were those specific to FM, the pain Visual Analogue Scale (VAS, scored from 0 to 10) and the Fibromyalgia Impact Questionnaire – Spanish version [9] (FIQ, scored from 0 to 100), and the Gastrointestinal Symptom Rating Scale – Spanish version [10] (GSRS, scored from 0 to 7); for all of them, 0 indicates better health and higher values indicate worse health. Also the patients' weight was measured at the start and end of the study (Table II).

Student's *t*-test for paired samples was used as the main statistical method, with a significance of $p < 0.05$.

Bioethical standards

This study was approved by the local ethics committee of our centre and all participants signed an informed consent form before being included in the study.

Results

After 6 months of follow-up, 32 out of 40 in the diet group and 35 out of 44 in the control group completed the study. The main reason for dropout in the first group was monotony of the diet, and in the second group dropout from follow-up. No side effects were reported in either group.

The foods excluded after histamine intolerance testing and their respective percentages are shown in Table I. The mean number of positive foods per patient was 3, with a range of 1 to 5. The most common combination was milk products and gluten-containing cereals (which occurred in 47% of the patients). At the end of the study there was variation in the scales studied as shown in Table II, being statistically significant ($p < 0.05$) for GSRS and total body weight, but not for VAS and FIQ.

When performing a sub-analysis of the parameters in the GSRS scale, the parameters that changed the most were: bloating, belching, constipation, bowel sounds and hunger pains. It is noteworthy that 3 patients who underwent the exclusion diet noticed an improvement not only in GSRS and body weight, but also in VAS and FIQ from the first days until the end of the study.

Discussion

There is growing interest in food intolerance problems that create non-specific abdominal complaints, in certain population groups, such as FM patients. However, studies to date on these patients with different dietary approaches have been contradictory [6]. It has been reported that 40% of FM patients consider that diet has a major influence on their symptoms, and 42% report an aggravation of their symptoms following the ingestion of certain foods [11].

In another study, 68% of patients were reported to use nutritional supplements in an attempt to improve symptoms [3]. Despite this, it is not known to date which foods cause such worsening [5], and there are no studies to date that specifically study these foods, only studies that eliminate foods based on what the patient assumes may be bad for them [12].

Our study attempts to make the link by means of a specific intolerance test, confronting the patient's blood with certain common foods in our diet, mainly proteins, and measuring the elevation of blood histamine. We found a strong relationship between the exclusion of certain foods and relieving digestive symptoms (including assessment of body weight) in patients after 6 months of follow-up. No significant improvements in other parameters were obtained, except in isolated cases of patients who reported a clear improvement in pain or fatigue.

A disproportionate amount of histamine in the body is suspected to be the result of the consumption of histamine-containing foods or beverages, and the reduced ability of enzymes to digest and degrade histamine [13]. In so-called histamine intolerance, impaired histamine degradation in the gastrointestinal tract causes functional, non-specific intestinal and extraintestinal discomfort [14]. Unbalanced and elevated histamine in intolerances seems to be the main consequence of ingestion of histamine-containing foods [15].

There is growing scientific evidence and studies supporting this idea [16]. However, standardised assessments and/or reliable laboratory tests are needed for the define diagnosis of histamine intolerance [13].

We propose this new specific histamine release test as a diagnostic and therapeutic method in FM patients suffering from various digestive disorders, and even in some cases extraintestinal disorders.

Study limitations

This work has the limitations of an observational study, with a small sample of patients, but it opens up an interesting avenue for future research. Therefore, although dietary aspects appear to be a promising complementary approach to the treatment of FM, more research is needed to provide the most effective strategies for the management of this disease.

Conclusions

Following an exclusion diet based on a specific histamine release test, digestive symptoms improved in FM patients, including assessment of GSRS and body weight. In some cases, an overall improvement in symptoms was observed. Further studies are needed to support these findings.

The authors declare no conflict of interest.

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